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EDITORIAL.

IT looks as though the unqualified anæsthetist would soon cease to exist in the United States. This particular obstruction has been spared to the progress of anæsthesia and the welfare of the professional anæsthetist in Great Britain. We have never developed the system of nurse anæsthetists which has been so widespread in America. However skilled these administrators may have been, theirs must always have been a rule of thumb performance and they could never, in the nature of things, help in the progress and development of their art. They were taught to carry out certain tasks in a definite and unvarying way, and this they accomplished no doubt with perfect satisfaction to the surgeons for whom they worked and by whom they were largely trained. Presumably the sole responsibility for the patient's safety must have remained always with the surgeon, and it is hard to imagine the nurse—or any other unqualified—anæsthetist being in a position to advise the surgeon usefully as to the general condition of his patient during the progress of the operation. Yet it is surely one of the most valuable qualities of the anæsthetist that the surgeon should be able to rely on him confidently for immediate warning when the patient's condition is departing in any way from what is perfectly satisfactory and free from all cause for anxiety. With us, of course, there is also the consideration that any fatality occurring during the administration of an anæsthetic in unqualified hands would lead to awkward questions for the operator in the Coroner's Court. The abolition of the lay anæsthetist—whether nurse or not—is a necessary step in the

upward progress of anæsthesia. The anæsthetist must have, in the words of Mary Botsford, "not only the necessary skill but the authority to diagnose and treat the emergencies which may arise. He is, or should be, the physician of the surgical team."

In the article from which we have just quoted Miss Botsford reviews the position of anæsthetists generally in the United States. She finds two causes for dissatisfaction, i.e. lack of teaching of anæsthesia in the medical schools and insufficient remuneration of medical anæsthetists. Nevertheless, during the past year and a half the specialty of anæsthesia has, she says, "added more worth while young medical prospects to its ranks than during any other period for the past twenty-five years, and the international field of anæsthesia is beginning to respond with most gratifying results to the stimulation of the specialty in the English-speaking world." The American College of Surgeons, in their Hospital Standardisation Report, show clearly that American surgeons at any rate recognise to the full the necessity for ample education in anæsthesia, and for a properly organised anæsthetic department in hospitals and for the presence there of trained medical specialists with appropriate standing and full opportunities. They declare for a "staff of trained and experienced anæsthetists." Also they find that "a complete physical examination should be made of each patient and laboratory findings reviewed prior to administration of an anæsthetic. An efficient follow-up of all post-anæsthetic cases and records on anæsthesia should be kept and correlated for the purpose of aiding in research." An interesting recommendation in the Report is that the services of the chief anæsthetist "should be utilized also for the care of non-surgical cases, such as mental disorders, asphyxiation, certain toxæmias, etc.

HYPNOSIS AND ANÆSTHESIA.

By Dr. BERNARD HOLLANDER.

[A Lecture delivered to the Section of Anæsthetics of the Royal Society of Medicine, on Friday, 5th February, 1932.]

HYPNOTISM for the prevention and alleviation of pain has been practised by mankind in some form or other throughout the ages. One form of it is familiar to all ofus. When a child who has hurt itself runs to its mother crying and she strokes the injured part, reassures the child, takes it up in her arms and rocks or sings it to sleep, she is unknowingly exercising an hypnotic influence. The methods of priests and magicians in ancient times, in healing the sick, appear to have been of a hypnotic kind; and the temple sleep of the ancient Greeks and Egyptians seems to have been of a similar nature. Celsus, the Roman physician, tells us that the old Greek father of physic, Asklepiades, practised light friction as a means of inducing sleep in frenzy and insanity; and, what is more remarkable, he says that by too much friction there was a danger of inducing lethargy. In all ages, and amongst all nations, a certain sanative efficacy has been ascribed to the touch of the human hand, to the placing of it upon a sick person, or rubbing with it any part of the body that may happen to have been exposed to injury. Healing by touch was practised by kings and professional healers in Western Europe until quite recent times.

Hypnotism, as practised at the present day, became popularly known at the end of the eighteenth century, when a Viennese physician, Friedrich Anton Mesmer (1734–1815) settled in Paris in 1768, and used what he believed to be "magnetic emanations" for the purpose of medical treatment. According to his view, the whole universe was filled with magnetic fluid, more subtle than ether, and which could be passed from magnetiser to patient; and he asserted that this "animal magnetism," as he called it, possessed great healing properties. Princes and nobles thronged to consult

the "great magician," and in order to treat the crowd of patients that flocked to him, Mesmer gave up individual treatment, and invented his famous magnetic "tub," to enable him to give mass treatment. Public sentiment then turned against him, and the medical faculty attributed his success to the power of "imagination," and condemned him as an imposter. Whatever may be said against Mesmer's theory, and the methods he employed, there can be no question that he genuinely applied them as a remedy for human suffering, and that very often there was produced such a profound impression upon the system of the patient as to effect the relief or cure of a certain order of malady. "Mesmerism," as the procedure was subsequently called after its originator, proved most effective in the production of anæsthesia for surgical operations, and has never been equalled in that respect.

One of the earliest operations performed in the magnetic sleep was in 1821, by J. C. A. Récamier, Professor of Gynæcology in Paris. Similar ones were performed at other hospitals under the direction of Baron du Potet. One operation in particular created a great sensation, namely that by M. Jules Cloquet, one of the most eminent surgeons of Paris in his time. Authentic details, of which I can only give a brief account, are preserved of it, for he reported it to the Academy of Medicine, on April 16th, 1829.

The patient, a woman, 64 years of age, suffered from cancer of the right breast, with considerable enlargement of the axillary glands, which caused her pain and loss of sleep, for which her physician, Dr. Chapelin, used to mesmerise her. It was he who proposed to M. Cloquet to operate while the patient was under mesmeric influence. The operation was arranged to take place on Sunday, April 12th. An hour before the operation the patient went to church to attend mass, as it was her custom to do every Sunday. When M. Cloquet arrived, at ten in the morning, he found the patient sitting undressed in an armchair in a mesmeric condition. Her physician supported her right arm; the left was allowed to hang down by her side. M. Pailleux, of the Hospital St. Louis, was in charge of the instruments. An incision was made from the axilla to the inside of the breast, both above

and below, the tumour was then removed, and the engorged glands dissected out. The operation lasted twelve minutes.

Now comes the interesting part of the procedure:—"During all this time the patient continued to converse tranquilly with the operator, and gave not the last sign of sensibility. No movement in the limbs, nor in the patient's features, no change in the respiration nor in the voice, and no changes in the pulse were observed." After the ligatures had been applied, the wound was united by adhesive plasters and dressed, and the patient was put to bed and left in the mesmeric state for 48 hours. The first dressing was removed on the following Tuesday, and during the cleaning and dressing of the wound there was neither sensibility nor pain, and the pulse-rate had its natural rhythm. After the dressing Dr. Chapelin woke the patient. The lady remained unconcerned, but when told she had been operated upon, and on seeing her children around her, she evinced considerable emotion, which was checked by immediately putting her to sleep again. (*Bulletin de l'Académie de Médecine*, Paris, Vol. II, p. 370).

When Cloquet read this account to the Academy of Medicine, Lisfranc, also a celebrated surgeon, got up and declared Cloquet must be either an impostor or a dupe. That opinion, however, did not deter others from operating under similar conditions. At another meeting of the Academy, on January 24th, 1833, Dr. J. E. Oudet reported having extracted several teeth in the mesmeric trance; but he was received with the same incredulity as Cloquet.

Yet a change in the attitude of the French medical authorities seems to have set in a few years later, for, on March 10th, 1841, Dr. Talbot-Descourty, a surgeon-dentist, operated on a patient in the mesmeric state, in the presence of the Dean of the Paris Medical Faculty, and other eminent medical gentlemen.

In England, too, teeth extractions under mesmeric influence were frequent at that time; for instance, by Mr. Martin, a dentist of Portsmouth (1841), and by Mr. Rideaux, a medical practitioner of Southampton, who published five such cases in 1842. Dr. John Ashburner, of 55 Wimpole Street, in 1844,

mesmerised a girl for Mr. Toms, dentist to the Middlesex Hospital, who extracted eight teeth at one sitting.

Mesmerism in England and Scotland had many sincere and learned advocates at this period, such as Gregory and Mayo, both Fellows of the Royal Society, Ashburner, Colquhoun, and others; but the leader of the mesmeric movement was Dr. John Elliotson (1791–1868), also a Fellow of the Royal Society, and one of the most distinguished physicians of his day. In addition to being Lecturer on Medicine in London University, he was also one of the founders of University College Hospital, President of the Royal Medical and Chirurgical Society, the first physician to practice auscultation, and to use the stethoscope, and one who enriched the British Pharmacopœia with several new drugs. A demonstration of mesmerism by Chenevix, F.R.S., in 1829, first drew Elliotson's attention to the subject; but it was only after seeing Baron de Potet's exhibitions, in 1837, that he commenced his own researches. Every effort was made to induce Elliotson to abandon the subject, and, when he would not desist, invective and vituperation were heaped upon him, and the Council of University College Hospital was forced to prohibit the practice of mesmerism within the Hospital, with the result that in 1838 Elliotson resigned his position.

As a result of Elliotson's efforts "Mesmeric Infirmaries" were established in Marylebone (36 Weymouth Street), Edinburgh, Dublin, and elsewhere, and many surgical operations were painlessly performed upon mesmerised patients. In Exeter alone 200 operations were performed by Mr. Parker, a surgeon. A booklet giving an account of these operations was published in 1843 ("Numerous Cases of Surgical Operations, Without Pain, in the Mesmeric State," by John Elliotson, M.D., F.R.S.). The most interesting case was one of amputation of a leg above the knee, done in the District Hospital of Wellow, Nottinghamshire, and brought before the Royal Medical and Chirurgical Society of London in 1842.

The mesmeriser was Mr. W. Topham, barrister of the Middle Temple, the surgeon, W. Squire Ward, of Wellow Hall. The patient, a labourer, 42 years of age, had an ulcerated knee joint, which caused him the most excruciating agony

and almost constant insomnia. He was mesmerised every day for ten days before the operation, which took place on October 1st. The patient was soundly asleep while the flaps were cut "The placid look of his countenance never changed for an instant; not a muscle was seen to twitch. To the end of the operation, including the sawing of the bone, securing the arteries, and applying the bandages, which occupied, in all, a period of upwards of 20 minutes, he lay like a statue." At one time a low moaning was heard, but it did not seem connected with the operation, for the surgeon, as a test, pricked the sciatic nerve forcibly with the points of a forceps, but without any increase in the moaning. Besides, the patient's countenance retained its placidity all the time. After the operation he "gradually and calmly" awoke. After looking round, he exclaimed: "I bless the Lord to find it all over." He confessed that he had not felt any pain at all. He was again mesmerised for the first dressing of the wound. "Within 24 hours after the operation he was singing. In three weeks he sat up for dinner, and had not a single bad symptom."

No sooner had this paper been read, than up rose Mr. Coulson, a surgeon, who exclaimed: "The paper ought never to have been read; for the only point of interest was the non-expression of pain, and that was a common thing, and he had no doubt the man had been trained to it." Other surgeons were of the same opinion, Marshall Hall, the famous physiologist, said that the case proved too much, or, rather, flatly contradicted itself, because (on the principal of reflex movements) "the sound leg ought to have contracted when the diseased one was cut." Sir Benjamin Brodie agreed with Marshall Hall. On the other hand, Mr. Wood, who had assisted in the operation, vouched for the accuracy of the whole account of it.

At the following meeting of the Society it was proposed by Dr. Copeland to expunge the record of the meeting, for, he contended that: "If the account of the man experiencing no agony during the operation was true, the fact was unworthy of their consideration, because pain is a wise provision of nature, and patients ought to suffer pain while their surgeon

is operating; they are all the better for it, and recover better." The motion was seconded by Dr. Evans and agreed to.

Dr. Elliotson recorded in his journal, *The Zoist*, altogether 16 amputation, 28 operations for tumours (some of them of enormous size), and 150 other surgical operations, besides a number of painless parturition cases; most of them witnessed by a number of medical men.

Most interesting are the records of the Hospital at Cherbourg of surgical operations in the mesmeric state between 1845 and 1847, one being the removal of a portion of the lower jaw, and another, on Friday, 4th June, 1847, (as reported in the *Journal de Cherbourg* and *Phare de la Manche*), when three patients had enlarged glands of the neck removed. Dr. Durand, a professor of philosophy of Paris, was the mesmeriser; Dr. Loyal, the operator; and Major Fleury, a military surgeon, the assistant. To this performance all the notabilities of Cherbourg must have been invited, fir in the list of those who signed the report are the names of doctors, lawyers, clergymen, naval and military men, head masters of schools, the mayor and other officials of the municipality, including the tax collector.

Elliotson's work was taken up in 1843 by James Esdaile (1808–1859), a graduate of Edinburgh, and Medical Officer of the East India Company. He was in charge of the native hospital at Hooghly in Bengal, and used mesmerism for the production of anæsthesia in thousands of surgical operations, including 300 capital ones. Amongst the latter were 20 amputations, three cataract operations, three for strangulated hernia, one lithotomy, one amputation of the penis, and about 200 for the removal of the enormous scrotal tumours due to elephantiasis, so common in India. They are recorded in his two publications: "Mesmerism in India," 1846, and "The Introduction of Mesmerism as an Anæsthetic and Curative Agent," 1852.

Let me quote the account given by Mr. Allan Webb, Professor of Anatomy of the Medical College of Calcutta, who went to see Esdaile's Hospital on an operating day (15th October, 1846). He described how he saw the compound full of carriages which had conveyed distinguished medical men and other eminent spectators, who had travelled as much as

50 miles and "had braved the terrors of a burning sun to witness the extraordinary performance of a surgical operation free from any pain."

He found the patients, who were to be operated upon, in their beds in the square open courts. All were sleeping profoundly, while at the head of each bed stood the native mesmerisers. The first case was one of a large elephantoid tumour, which was afterwards shown to be 50 pounds in weight; next came one of cancer, "a dreadful looking mass." Next came the paring down of a big ulcer in the leg of another patient. These patients never stirred, and slept like little children, "whereas had they been sensible, this would have been torture so excruciating that the whole hospital would have rung with the shrieks of the patients." "I have seen many," Mr. Webb goes on to say, of those who had undergone these operations in the normal waking state, "with the cold sweat of agony bubbling up for hours afterwards, and a pulse so depressed that it was hazardous to move them; whereas these patients were quite chatty and lively."

Dr. Stewart, another witness, reported that the whole scrotal operation took six minutes, including the ligatures to the spermatic arteries and some other vessels that spouted. For his own satisfaction he held the pulse of the patient the whole time. Only towards the end did it become intermittent. The patient was then fanned and cold water dashed in his face; whereupon he woke, drank some water that was given to him, and subsided again into perfect repose, when some more small vessels were tied. Dr. Stewart visited the patient the next day, and found him looking well.

The Governor of Bengal appointed a commission to investigate the matter, which confirmed that, in respect of the six operations witnessed by its members, no pain was felt by the patients. Dr. Esdaile thereupon got charge of a small hospital in Calcutta for his specific purpose and exclusive use.

Dr. Esdaile claimed that he lost not a single case as a direct consequence of the operations, though some of them had been very severe. Only five per cent of his patients died, and those in consequence of lockjaw, cholera, and other intercurrent diseases. We must not forget that these were the old septic days, before the advent of Lister.

Contemporary with Esdaile and Elliotson there was a Manchester surgeon, James Braid (1795–1860), who started mesmerism on a new career, and gave it a new name: hypnotism, from hypnosis = sleep. In 1841 he had attended the conversazione of Lafontaine, a professional mesmerist, and readily perceived that all the phenomena were not the result of trickery. He found that intense gazing upon an object, accompanied by concentration of mind, will displace the threshold of consciousness in a varying degree, depending upon the mental characteristics of the individual, and the circumstances surrounding him. The subconscious mind is thus brought into play. The first result is a condition resembling sleep—nervous sleep—neuro-hypnotism, or hypnotism for short ("Neurypnology," 1843).

Now, hypnosis is not sleep. True, we can use hypnosis to send a patient to sleep; but unless contrary suggestions are made he is wide awake, only his attention is concentrated on the operator, his voice and action, and he can carry on a conversation if so desired, as we have seen in Cloquet's case. In ordinary sleep, on the other hand, as soon as consciousness is lost the subject loses connection with the outside world.

Hypnosis is purely a psychical state; whereas natural sleep is dependent on changes in the circulation and chemistry of the brain. Under hypnotic suggestion people fall asleep without fatigue to help them, and may be made to sleep so deeply that even surgical operations on them do not wake them; but ordinary sleep needs to be helped on by fatigue and other physiological changes, and is often hindered by pain and pathological inhibitions.

Many of the patients who come to be hypnotised think they must fall into ordinary sleep. If they do so it only hinders the process. I have seen them on the couch "snoring." That did not make them better subjects.

Braid was much struck by Esdaile's results, and had also used hypnosis in surgery; chiefly for teeth extraction. He practised the "gazing" method. Later, however, on finding that his experiments succeeded equally well with the blind, he dropped his ideas of hypnosis and developed the theory of "suggestion." He found that hypnotism acts subjectively

and objectively, and that the expectant idea in the mind of the patient is the real agent. But just as "animal magnetism" and "hypnotism" involve a special theory, so does "suggestion," which, as I shall have occasion to explain further on, covers only a limited portion of the ground.

Braid, in 1842, offered a demonstration on hypnotism to the Medical Section of the British Association for the Advancement of Science, held that year in Manchester, but his offer was spurned. Altogether, he aroused but little attention during his lifetime.

When we consider the hostile attitude of the medical profession towards the chief representatives of animal magnetism and hypnotism, and when we recollect that in France physicians who supported or practised mesmerism were at one time (after the unfavourable report of the Academy of Medicine) struck off the register, we cannot wonder that the subject, with the death of its pioneers, was relegated to the travelling showman.

Mesmerism as an anæsthetic might certainly have come into general use had it not happened that, just as its merits were becoming known, chloroform anæsthesia was introduced by Sir James Simpson in 1847. Orthodox medicine, committed to a denial of the efficacy of psychic healing, welcomed the new anæsthetic with acclamation.

The aseptic method of performing operations, introduced by Lister, has enabled surgery to make wonderful strides; but another factor in its success was the discovery of anæsthetics. What must have been the agonies of patients in pre-anæsthetic days, considering that, at the present day, people shudder at the thought of having the slightest incision made without being rendered unconscious, either entirely or having a local anæsthetic applied!

I know of a whole list of surgeons, contemporaries of Elliotson, Esdaile, and Braid, who regarded mesmerism, or the hypnotic trance, as the accomplished fact of anæsthesia and the long hoped-for panacea whereby suffering humanity could pass unflinchingly through the ordeal of the surgeon's knife. In France, A. B. Richerand had tried it and had pronounced in fabour of its value, and other surgeons, less eminent, were willing to swallow the doubtful reputation of

Anton Mesmer and take the risk of being struck off the register, so long as they could benefit their patients by employing methods which had been exploited by him.

Internal medication by narcotic substances, to prevent pain in surgical operations, was known in ancient times. In the days of Hippocrates the root of the *atropa mandragora* was used for that purpose. It is mentioned also by Albertus Manus. The vapours given off by these medicaments were noticed to have a stupefying effect on those who prepared them, and in this way they came to be applied for surgical purposes in the thirteenth century and were in general use in the fifteenth century. Even local anæsthesia for surgical operations was known in ancient times. Pliny mentions *lapis memphiticus*, which was applied in the form of an ointment over parts which were to be cut or cauterised, in order to render them insensitive.

Sir Humphry Davy, the great chemist, had suggested nitrous oxide as an anæsthetic in 1799, but the suggestion was ignored. In 1818, Faraday called attention to the stupefying effects of ether. In 1820, Henry Hill Hickman experimented with carbonic dioxide, and later with nitrous oxide gas, on dogs, rabbits and kittens. In 1825 he placed the results before his professional brethren, but everywhere he was met with the greatest sceptism, and his system was derided generally and condemned as dangerous and useless. Disheartened by his failure to secure a hearing from the profession in his own country, Hickman laid the matter before the Royal Academy of Medicine in Paris, in 1829, but although Baron Larrey, the Surgeon-General of the Grande Armée, offered himself to be experimented upon, Hickman's discovery was received by the majority of the members with derision and contempt, and the demonstration was allowed to drop. Discouraged and broken-hearted, he returned to England and died a few months afterwards at the early age of twenty-nine.

Like the British authorities I have mentioned, so Alf. Velpeau, at that time the leading surgeon of France, declared that the abolition of pain in surgery was a chimera which it was no longer permissible to pursue. Magendie, the great physiologist, supported the view of Dr. Copeland, before

mentioned, namely, that he believed that pain was useful, and expressed doubt whether there was any real advantage in suppressing it by making patients insensible during an operation. He added that it was a trivial matter to suffer, and that a discovery the object of which was to prevent pain was of little interest.

In 1842, Dr. Crawford and A. Williamson Long, two Americans, made the first trial of ether inhalation, but they did not exploit it. On October 16th, 1846, the first operation under ether anæsthesia was successfully performed in the Massachusetts General Hospital, Boston, by Dr. J. Collie Warren, the administrator being William T. G. Morton. G. T. Jackson and Horace Wells, of Hartford, Connecticut, also claimed to have used anæsthesia (nitrous oxide) in dentistry in 1844, but Long proved his priority. A fatal case caused Wells to end his life.

Sir James Simpson, of Edinburgh, introduced chloroform anæsthesia for surgery and midwifery at the end of 1847, as I have mentioned. Ether was neglected in favour of the new element. Chloroform was suggested to Simpson by David Waldie, a pharmacist. The first trial was made in November, 1847. Previously, in March of the same year, J. P. Flourens, the renowned brain physiologist, had read a paper before the Académie des Sciences on the effects of chloroform on the lower animals; but as in the case of Sir Humphry Davy's discovery of the pain-subduing power of nitrous-oxide gas in 1800, no notice was taken of the communication. Chloroform was rejected for some time by surgeons, and its employment in midwifery was considered to be contrary to the teachings of the Bible.

I have already explained how, after the death of their pioneers, mesmerism and hypnotism were relegated to the sphere of the travelling showman.

In 1879, such a travelling hypnotist, the renowned Hansen (by whom, by the by, I myself was hypnotised successfully), like the Abbé Faria, only just escaped imprisonment in Vienna for what was still held to be a fraudulent practice. He was ordered to leave Austria, and went to Breslau, where he succeeded in convincing Heidenhain, professor of physiology, of the reality of hypnotism. Heidenhain investigated the

phenomena seriously, and converted the German medical profession. Professors Krafft-Ebing, Obersteiner and Benedikt of Vienna, Möbius and Wundt of Leipsic, Preyer of Jena, and Eulenburg of Berlin (to mention only a few medical celbrities who had seen Hansen's demonstrations) now took up the subject in earnest. Giving honour to whom honour is due, they recognised the merit of James Braid and translated his work, which had been quite forgotten in England. In 1880 the British Medical Association invited Prof. Preyer, the translator, to give a lecture on "Braidism," as hypnotism was then called. Ten years later the subject had made so much progress that at the Birmingham meeting of the British Medical Association, in 1890, a committee of physicians was appointed to test hypnotism psychologically, physiologically, and therapeutically. This committee reported favourably, and, what is more interesting, it recommended it warmly for therapeutic purposes, especially for pain. Consequently, when, in the early nineties, at the request of Dr. (afterwards, Sir) David Ferrier, I hypnotised some of his patients at King's College Hospital, there was no longer any opposition. Indeed, at Krafft-Ebing's clinic in Vienna, where I subsequently worked for a year, hypnotism was a regular form of treatment for functional, nervous, and mental disorders.

In France, too, hypnotism was revived. Dr. Liébeault, of Nancy, was the first to take it up. He held that the key to all hypnotic phenomena lay in "suggestion," that is to say, he found that hypnotism was not even an instrument, let alone a curative principle, but merely a psychical condition in which another instrument—suggestion—could be more readily applied than in the normal waking condition. To put it in more concrete form, he found that *a patient might be hypnotised every day for a month without advancing his recovery in the smallest degree; but that, if during hypnosis it was suggested to him that recovery was about to take place, then, during the waking state, something within him proceeded to carry that suggestion into practical effect.*

Liébeault remained in obscurity until his pupil, Dr. Bernheim, by the publication of his book on "Therapeutic Suggestion," made his theories popular. In a few years

Bernheim had hypnotised about 10,000 patients, and was successful in 85 per cent of his cases.

Meanwhile another big school had grown up, in Paris, under the guidance of the famous Prof. Charcot, who declared that the state of hypnosis was nothing but an artificial nervous condition, a neurosis akin to hysteria, the various manifestations of which could be aroused at the will of the hypnotiser, both by physical and psychical means. We know now that Charcot's view of hypnosis was largely influenced by the fact that his experiments were made chiefly upon females already in a highly nervous condition. When experiments are made upon other soil the results are very different from those recorded by Charcot. Hence the Nancy school had steadily prospered, whereas the Charcot school had lost favour.

According to the Nancy school, all the manifestations of of hypnosis depended entirely on suggestion, and, even when no words are spoken, there is still "unconscious" if not "conscious" suggestion. This is contrary to my own experience, and I hope to convince you of the fact that hypnotism is not all suggestion, for analgesia can be produced by purely physical means without the patient knowing what is expected of him. The word "suggestion" has been too generally adopted, as if it explained all mysteries. It is true, however, that *hypnosis is a process which makes suggestions operate as they do at no other time, and that through them functions are affected which ordinarily elude the action of the waking will.* I have frequently left boys, who were brought to me for bed-wetting and other troubles, and who were too young to know anything about hypnosis, alone in a room, gazing at a glass crystal,making no other remarks but that they must not look away and that I would come back in ten minutes, and when I have returned I have found them in the cataleptic state.

That bodily functions which are not under voluntary control can be influenced in that state is proved by the many cases of chronic amenorrhœa which I had to treat, many of these young girls having got well in one sitting, merely by my telling them in hypnosis that their menses would appear that very night. It may be said that this clearly was suggestion; but no one has yet explained why a few words,

quietly spoken, should produce such a powerful effect on an unconscious physiological process.

I hope to prove to you that the hypnotic state is largely a condition of more or less profound abstraction or absent-mindedness. Psychologists would call it a state of dissociation.

I do not attempt to get the patient to sleep, but to produce a passive concentration—without conscious effort or strain—so that the subject becomes unaware of his surroundings, pays no voluntary attention to his environment, and, as I shall demonstrate to you, he very soon forgets that he has a body and limbs. His senses are quiescent, except for the direction that one or other is given by the operator, so as to concentrate the attention. The state produced is identical with the state of reverie when a person is meditating deeply and does not notice his sensations. In reverie, as in hypnosis, there is such a concentration of mind that the external world is obliterated, and neither things, persons, nor events that are passing about him, are taken notice of; and, what is of more importance, the body is ignored, and any discomfort or pain that may have pre-existed is now negligible and not felt. This state is also akin to that of a man in ecstasy over his work, who for the time being is relieved from all his bodily woes, and may even forget his earthly needs. Moreover, he may not feel any pain, as happened to Marini when writing his "Adone," when he did not notice a serious burn of his foot.

Many of the ecstatics and mystics of the Middle Ages, who were accused of being in league with the devil, must have possessed the gift of self-hypnosis; for when they were made to walk on burning coal or red-hot iron as a proof of their innocence they did so without apparent pain or damage. Some could hold a hand over a blazing fire without flinching.

Ecstasy is merely a superlative degree of attention. It is a state in which all sensations and thoughts are suspended, except the one which forms the subject of contemplation; the same as in hypnosis. In religious ecstasy the self-absorption may be aided by fixing the gaze upon some holy figure, just as we get the subject for hypnosis concentrated by looking at some object, and, as I shall explain in a moment, directing

the eyes upwards. After all, what do we mean by saying that a man seems as if "hypnotised," but that his whole interest is so concentrated on one point that he neglects everything outside himself and every sensation. The visions of ecstatics may become realities to their minds, as when they see angels and other supernatural beings, not visible to anyone else; and the same thing happens as regards the visions suggested to the persons in a state of hypnosis.

That pain, in certain states of mind, is not conveyed to the brain, that it does not become a conscious reality, is proved, also, by the fact that we sometimes see madmen commit horrible mutilations with very blunt instruments without exhibiting any sign of feeling.

Another familiar example of the effects of concentration may be observed when a man in the street is made to look up to the sky in expectation of seeing some strange object, and he gazes so intently that he does not feel the hand of the pickpocket extracting his watch. It is a well-known trick of thieves to get an accomplice to knock against a man suddenly, so that he becomes indignant, and during his emotional pre-occupation he does not notice a robbery being effected, only becoming aware of his loss later.

The late Mr. Alfred Wallis, a well-known dentist and member of several committees of the British Medical Association, was so well acquainted with my methods, through the patients I brought him, that one day he practised them on me without my knowledge. I was seated in the dental chair, had the gag fixed in my mouth, and saw the anæsthetist holding the facepiece a little distance away from me, while entertaining me on a topic of great interest (evidently instructed by Mr. Wallis), so that I became absorbed in talk, until he made me laugh, when I remarked that it was time to get ready, and was thereupon shown the tooth extracted by Mr. Wallis, without my having been conscious of it. I complimented the anæsthetist on his cleverness. If he happens to be present to-night, perhaps he will be good enough to enlighten the audience as to the procedure on that occasion. I must mention, in this connection, that I knew that Mr. Wallis, in his hospital practice, often directed his assistants to apply

gas, whereupon the facepiece would be put on but no anæsthetic given; yet the patients did not feel any pain whatever.

Some of those who hold that hypnotism is all "suggestion" have declared that the effect of chloroform is occasionally due to suggestion, inasmuch as frequently the patient is asleep after a few breaths. I am not in a position to decide the question; but in connection with the procedure of Mr. Wallis, just mentioned, it may interest you to know that Dr. Hallauer (Berliner klinische Wochenschrift, 1908), a specialist for diseases of women, has performed painless operations in the same manner. He proceeded as follows: All the preparations for an anæsthetist were gone through as usual. Once on the operating table he applied from ten to fifteen drops of chloroform to the mask in full view of the patient and told her to breathe quite quietly. When there were any movements, struggling or coughing, he removed the mask for a few minutes and carefully placed it again over the face as soon as this had subsided. From time to time he added two or three drops of chloroform, mentioning the fact aloud as he did so, and stroking the forehead or hair, always in one direction. He explained to the patient that she was getting sleepy and that sensation was gradually disappearing. The suggestion that complete unconsciousness was setting in came next, after actual drowisness had begun. Hallauer's method did not require more than from twenty to forty drops of chloroform for any one operation. As soon as the operation was over he told the patient to wake up, which she did without experiencing any ill after-effects. Even patients who had been a little restless during the operation declared that they had not felt anything. One of the chief advantages of Hallauer's method is, in my opinion, that if it fails it is easy to continue the administration of chloroform in the usual manner. The same can be done with any form of hypnosis for the purpose of anæsthesia, so that it can be definitely 'ated that in no case can harm come by it to a patient.

Local insensibility to pain, for minor operations on the throat, has been induced by Barth by a similar method of suggestion, namely, by persuading the patient that the solution of common salt with which his throat was being

painted was cocaine, and, therefore, rendered the mucous membrane insensitive.

After these preliminaries you will want to know how I proceed to induce the hypnotic state. I shall give you first a general description, and then show you how the methods can be applied to producing analgesia and anæsthesia.

I get a large number of patients sent to me, *generally as a last resource,* suffering from neuralgia, neuritis, migraine, and insomnia due to pain; but the majority of my patients are addicted to the drink, drug, or abnormal sex habits, or suffering from morbid fears and obsessions, stammering and muscular tremors, besides mental cases on the borderland. I therefore follow a definite plan with all of them; that is to say I try, first of all, to acquaint myself with the individuality of the patient, encouraging him to talk about himself, his history, his illness, and so forth. This enables me to adapt my voice and manner to the mentality of the patient and to establish a chord of sympathy, which not only facilitates subsequent hypnosis, but enables me to make, when he is in that state, the *right* suggestion and such appeal to his intellect and emotions as will be most readily accepted by him.

No anæsthetist should neglect a short talk with his patient in order to get in touch with him; for everyone feels anxious when undergoing an operation, even when it is not so serious as to involve the possibility of a fatal issue, and anxiety is an emotion which has a disturbing effect. Therefore, a judicious and kind word spoken may actbeneficially on the patient. With this you are all familiar; but there is something else you can do by suggestion. Such a remark, after sounding the patient, as: "The heart is wonderfully sound," or "What a splendid pulse notwithstanding the long illness," or similar observations made to the surgeon or assistant within hearing of the patient, is taken a lot of notice of by him, and, so to say, "tunes" the mind for the operation. Let us not forget that the patient on the operating table is often already half hypnotised, and the final words are pondered on and may persist even when he awakens and is in a state of exhaustion, or nearly dying. I have often had to prepare patients who would not give consent to a necessary operation. One, suffering from cancer of the pylorus, told

me how happy he was on awaking from the anæsthesia, feeling no discomfort whatever.

The patient may be seated in a lounge chair, but generally I get him to lie down on a couch, with the body relaxed, and the mind passive and emotionally calm. Practically all the failures, when they occur, are due either to the nervous state of the patient or his active thoughts. Nervousness can be remedied easily; but the patient pursuing his own thoughts is often almost hopeless. Of this description is the man who keeps on thinking: "I wonder what that fellow is going to do next," or "Ten minutes are gone and I am not asleep yet," or, worse still, the man, usually a drunkard, who wants to get well, as if by a miracle, at one sitting, able to pass every public-house on his way home without taking a single drink, and having done nothing to get really reformed.

The patient lying comfortably on the couch, I then let him look at some object, generally the globe of a lamp, quite quietly, without strain, but keeping his eyes on it, so that he notices nothing else. The effect, after a time, is that the patient sees only a mass of light in front of him, and can no longer distinguish the globe. A tired feeling of the eyes becomes perceptible to the operator, and it will be seen that the patient either closes his eyes from fatigue, or turns his eyes upwards so that the pupil disappears from view, or he may merely start blinking with his eyes. In any case he is told now to close them.

When in my own treatment room I usually set an electric motor going at this stage and get the patient concentrated on the monotonous noise of it, so as to tire the auditory nerve as well as the optic, and to enable him to ignore other sounds which might wake him. But this procedure is not essential. I use it because I have found that very few persons can keep staring at a light and listening to a monotonous sound without getting drowsy.

We have now got the patient into the somnolent state, by the process of gazing. But we can also get him into that state by the Nancy method of talking to him, using persuasion and suggestion, describing to the patient the successive stages of sleep:—"Your eyes are getting heavy; you are getting tired; you can hardly keep your eyes open, they are closing now,"

and so on. I prefer trusting as much as possible to physical effects, because I have found that talking to the patient arouses the critical faculty.

Having got the patient to the therapeutic stage, the followers of the Nancy school, if they want to influence the patient's power of movements or his sensations, will now say to him: "You find it difficult to move your limbs; still more difficult; now you cannot move them at all;" and again: "Your pain is easier; it is getting less and less; now it has ceased altogether." This method is excellent, so long as we succeed with it; but woe unto us if we fail, for the patient will become convinced that hypnosis is no good to him, and that will be the end of it. Therefore, again, I trust more to a physical method which saves me talking, and which produces the same effects automatically.

The subject, lying quietly on the couch, with eyes closed, is first of all asked to breathe deeply and regularly: "1—2, 1—2." I have added occasionally: "Think you are inhaling an anæsthetic and getting less and less conscious." This, of course, is suggestion and is not essential. It is held by the Yogis in India that such regulated breathing alone is apt to induce anæsthesia, and this, according to Moll, has been confirmed by Bonvill and by Hewson.

I then ask the patient to keep his eyelids closed and to turn his eyes to the centre of the forehead, i.e. upwards and inwards. This is the position the eyes are in at the moment when we go to sleep at night, and causes the mind to become a blank. If the patient is now told to keep on looking up to the forehead, and at the same time to attempt to lift his eyelids, he cannot do so and will succeed only in raising his eyebrows. This manœuvre carries conviction to the patient that some powerful influence is beginning to assert itself. Indeed, a large number of patients find it difficult now to "think" at all —especially if the hypnotiser's thumb be pressed against the middle of the forehead of the patient—and cannot even make the effort to remember their name or address. Hansen, when he hypnotised me, held his thumb to my forehead and made me look up. When he asked my name I have still a vivid recollection that I could not make the effort to think, and that when he suggested it was "Brown," it gave me relief to

assent to it though I had a feeling that it could not be. Of course, if the patient were to turn his eyes down he could at once remember; but a good subject will not disobey his hypnotist.

What this turning up of the eyes actually does is to increase the concentration of the attention, focussing it on the hypnotist, his words and actions. David Ferrier ("The Functions of the Brain," 1876) found, long ago, that the movements of the eyes were concerned with the power of attention, and when he experimentally paralysed the muscles of the eyes in monkeys (by the destruction of the frontal lobes) "the animals presented an aspect of uninterest and stupidity," attention was lost, and they cound no longer think or take notice of anything. Prof. Elliot Smith, in his Montgomery Lecture in January, 1922, has further explained the importance of the movements of the eyes "as a profound stimulus to almost every part of the cerebral cortex" and that "*fixation of vision represents the germ of the powers of attention, and mental concentration in general.*"

This turning up of the eyes, I have found, has another powerful effect, which is of the greatest interest. Sensations from the body appear now not to reach the brain, or, more correctly speaking, do not seem to become conscious. Indeed, there is a feeling as if the body had become detached from the mind, as patients have confessed to me subsequently.

Owing to the loss of sensation the body and limbs are felt only as heavy masses, and there is immobility, or, at least, a loss of power to move them. In a good subject we may now raise an arm at right angles to the body, and it will remain in that position to the end of the sitting; whereas in the normal state it would soon drop. This insensitiveness of the body may go so far that the subject will not be conscious of the prick of a needle or a sharp pinch. If the patient has suffered from pain he does not feel it now, and can be told that it is gone for ever.

Public performers of hypnotism often thrust long needles into the muscles of hypnotised subjects. I have witnessed several such performances in public theatres, and one given for my own private benefit. In addition to other experiments the operator pierced a hand of the subject rather deeply with

a darning needle, and had difficulty in getting it out again. The hand did not bleed, but it became red. When I expressed my anxiety as to the consequences, the operator just made a few passes over the hand and the redness disappeared. He then woke the subject. I at once asked him whether he felt any pain, but he said "No," and on being told by me that he had been stabbed with a long pin, he searched for the injury all over his body; and when I directed his attention to the hand, he turned both hands over and told me he could see and feel nothing whatever of having been hurt anywhere.

One fact must not be overlooked; that is, that *sick people are more suggestible and more readily hypnotised than ordinary folks*. I have never induced hypnosis for a surgical operation, but I have frequently been sent for by surgeons when patients continued to suffer pain after operations, where the usual analgesic and hypnotic remedies had no effect.

Once I was asked by the surgeon in attendance to go to a nursing home in Hampstead where a young woman, dying from cancer of the uterus, suffered great pain which caused her to be sleepless. Within a few minutes the patient was asleep, and, in a few minutes more, wide awake with spasmodic pain. I persevered for an hour, at the end of which she seemed more peaceful. I heard no more for a week, when I received a letter thanking me for what I had done and stating that the patient had slept free from pain every night since my visit.

Another case, also in a Hampstead nursing home, was that of a medical student who had been run over by a motor lorry and had sustained a smashed ankle. After the operation he suffered agony. The joint was resected, but no cause for the pain could be found. Medicinal remedies were tried in vain, until the physician in attendance asked the operating surgeon to permit a trial of hypnosis. Again I had some difficulty; this time because of the resistance of the patient; but in the end I succeeded, as was acknowledged by the patient's doctor who called a few days later.

Another case was that of a boy on whom a mastoid operation had been performed. He suffered great pain after the operation, and said that it hurt him to eat. Again the wound was opened up, but nothing disturbing was found. The

surgeon then recommended a course of ionisation treatment, but that, too, was in vain. Then somebody suggested a trial of hypnosis. This time I formed such a favourable opinion of the case in question that I ordered a wonderful tea, with all sorts of delicacies that a boy loves, to be ready after the treatment. Actually, the pain was gone after the first attempt at hypnosis. I asked the patient whether he thought he could eat now. He replied that he would try; so I invited him to have tea, when he ate of all the things with great relish. That boy is now a distinguished Don at Oxford, and I know positively that there has been no return of the pain.

Another case of a different character was in a Wimpole Street nursing home, where a young woman, just returned from India, suffered from insomnia and chronic vomiting, the origin of which puzzled her physicians. After antitoxins and other remedies had been tried in vain for weeks, one of the consultants thought the cause might be mental and sent for me. This patient was another of those instantaneous cures, which, even though they occur rarely, are possible only in hypnosis. The patient slept well already the first night, and vomiting ceased on the second day. The sensation in the nursing home was so great that even men with broken legs asked for the doctor who cured Miss A.

Other extraordinary results to be achieved by hypnotism have been shown by me at private demonstrations to neurologists, alienists, and other members of the medical profession, and published in my books on "Hypnotism and Suggestion" (1910) and "Hypnosis and Self-Hypnosis" (1928).

I have already mentioned some of the early mesmerists who extracted teeth from patients in a trance. In more modern times there was Dr. J. Milne Bramwell, who, in 1899, created a sensation in medical circles by hypnotising a number of patients for Mr. Arthur Turner, a dentist of Leeds. Then there were dentists who hypnotised their own patients; for instance, Andrieu, of the Charité Hospital; also Hivert and Meiroud of Paris; Klemich of Bromberg; Sandberg of Skofke in Sweden (1892); and also Glogau of Frankfort, who recommended its general use in dentistry. Amongst English dentists who practised hypnosis were Charles Childs of Bungay; Nicholls of Burton Street, Mayfair; Nasmyth, Surgeon

Dentist to Queen Victoria; Carstairs of Sheffield; and Dr. Owens of Stourbridge.

Hypnotism has also frequently been applied for the pains of confinement. There was Dr. Wetterstrand of Stockholm (1887); Mesnet (1887); Secheyron of Paris (1888); Auvard (1887); Thomas of Toulon; Varnier (1887); Voigt of Leipsic; de Jong; Tatzel of Essen (1894); Dr. Kingsbury of Blackpool (1890); Dr. von Schrenck-Notzing of Munich (1891); Grandchamps (1889); Dr. Luys of Paris; Prof. Cajal of Barcelona; le Menant des Chenais of Paris; Delboeuf and Fraipont of the Lying-in Hospital at Liège. Dr. C. Pritzl published several cases; one, that of a primipara, was fully described in the *Weiner klinische Wochenschrift,* 7th November, 1885. Dr. Lafontaine published two cases (quoted by Gilles de la Tourette, "Hypnotism," 1889). Dr. Dobrovolsky, a Swiss obstetrician, reported eight confinements in the state of hypnosis. Altogether quite a respectable number of such cases have been recorded. In all the contractions of the womb were regular and strong, and perceived, but no pain was felt.

During this revival of hypnotism, hypnotic anæsthesia in surgery was again applied, among others, by Prof. Forel of Zürich; Tillaux and le Fort, two Paris surgeons; Voigt of Leipsic; Grossmann of Berlin; Howard, Professor of Surgery in Baltimore; Wood and Toll of Minneauolis; and Prof. Stark of Heidelberg. Dr. Bourdon, of Meru, in France, operated for fibroid tumour of the uterus (1898), and Dr. Schmeltz of Nice removed a sarcomatous tumour of the breast and a sarcoma of the left testicle in hypnosis (*Revue de l'Hypnotisme,* Vol. IX, 1897). In 1890, Haab, the celebrated eye surgeon of Zürich, used hypnosis in the operation of cataract. Lamphear, Aldrich, and others are mentioned by Moll as having used hypnosis for amputations, and Hulst for gastrostomy.

The doctors who have practised hypnosis for anæsthesia claimed the following advantages for it:—

1. No abstinence from food or other preparation is necessary.

2. Nervous apprehension can be removed by appropriate suggestion.

3. Hypnotism is pleasant and absolutely free from danger.

4. It can be maintained indefinitely, and terminated immediately at will.

5. The patient can be placed in any position without risk.

6. There is no tendency to sickness, during or after the operation.

7. Pain after operation, or during subsequent dressings, can be entirely prevented.

8. The rapidity of the healing process, possibly as the result of the absence of pain, is frequently very marked.

To this I would add a few further observations in order to dispel other misgivings.

Some people fear that a patient could not be awakened readily. Let me assure you that nothing is easier. I tell my patients that in 50 seconds (or any other time selected) they will be wide awake; and, exactly to time, they get up as well as if nothing had happened. Another method of mine is to tell the patient: "You will now count to five (or any other number), when you will awake, perfectly conscious and well." And he does so.

Others want to know, supposing you have said to a patient in hypnosis: "You will keep perfectly free from pain," or "You will touch no more drink," how can the operator be sure that it will come true? That also is simple. In perfect hypnosis the patient has no recollection of what has taken place until he again becomes hypnotised. I am, therefore, able to add, that when the patient wakes he will, after a few minutes, complain to me of stiffness in his arm or leg; or his mouth will be rather dry, and he will ask me for a drink of water. It is beautiful to observe the expression of the patient on waking, till he summons courage to speak to me about his discomforts. But if he does so, unconscious of the fact that it was on my suggestion, I know that I can trust him to carry out the other more important directions without fail.

It is said that a person with heart disease should not be hypnotised. Frankly, the first time I had a heart case I was nervous about it. Now, I no longer mind. One of the worst cases I ever had was sent to me by a Fulham doctor. It was a girl suffering from chorea, who had valvular disease of the heart, following on rheumatic fever. When I got her on the couch her pulse was 140. I quietened the girl with words and

passes, and within a few minutes her pulse was practically normal. As regards the chorea, she was another of those spontaneously recovering patients which you can find only in the application of hypnosis. But I have no theory to offer you to explain why those patients who make good hypnotic subjects recover so marvellously. I leave the inquiry to the research student of the comnig generation. This girl's case was published by me in the *Medical Press*, January 3rd, 1912.

As regards anæsthesia, there can be no doubt whatever that the anæsthetics of the present day are much surer in their action than hypnosis. No one in his senses would dream of displacing them. But there are cases of dangerous organic defects in which hypnotism might be preferable; or both, anæsthetics and hypnotism, might be tried together. It is well to remember, also, that persons who have been hypnotised before, will, everafterwards, make good subjects and can be used for the induction of anæsthesia, should a surgical operation ever become necessary.

Just one more observation before I conclude. I have given you in this essay a collection of facts and experiences which I hope will convince you that when we label certain phenomena as mesmeric, hypnotic, or due to suggestion, we are really only playing with words. The fundamental process by which mind influences mind and the mind influences bodily states and functions, is still wrapped in mystery. No patient, however, extraordinary, and no number of patients that I could bring before you, would carry such conviction as you would gain by your own experiments on suitable subjects. It is high time that systematic research was undertaken into these phenomena, in place of the scattered evidence of a few individual experts.

REMARKS ON ANÆSTHESIA AND ANALGESIA.

By CHRISTOPHER C. MARSTON, L.D.S., F.R.P. & S. (Glasgow).

THE generally accepted theories with regard to the effects of narcotic vapours are based upon empirical methods of administration.

Respirable narcotics should be administered by precise methods, which not only take into account the quantity of fluid used, but also the volume of vapour that is formed by volatilization of that quantity of fluid, and it is equally important that the volume of atmospheric air (required to make an anæsthetic mixture) should be measured with exactitude.

Mixtures containing different percentages of narcotic vapour and air should be regarded as distinct anæsthetics. With mixtures containing known percentages of narcotic vapour and air one can always foretell the physiological action upon the patient. The effect of any particular mixture is always the same, whether it is administered to a man, woman, or child; in fact, if a large animal such as a horse, and a small animal such as a mouse are given the same mixture of narcotic vapour and air, both are anæsthetised to the same degree of anæsthesia in precisely the same time.

All animals, including human beings, breathe a volume proportionate to their size, and when they breathe the same mixture the ratio of narcotic vapour and air is unaltered, only the respiratory intake of the mixture varies according to the size of the animal.

Idiosyncrasies arise from empirical methods of administration and formulation of mixtures, and are not met with when known percentages of narcotic vapour and air are used.

The truth of what I have stated can be demonstrated.

A few of the advantages of using mixtures containing known percentages of narcotic vapours and air can be shown by consideration of chloroform and ether. All proportions of

chloroform vapour above 10 per cent in anæsthetic mixtures cause sudden death by paralysing the heart primarily, and before any of the usual signe of anæsthesia show themselves, and all proportions below five per cent are incapable of seriously affecting the heart by any direct action of the drug. One does well to remember that at the temperature of 60 degrees Fahrenheit atmospheric air can absorb 12 per cent of chloroform vapour.

Ether.

The following table shows the time it takes to produce the third stage of anæsthesia in *all* animal subjects when mixtures of ether vapour and air are used:—

Percentage of ether vapour	Percentage of of air	Time taken to produce the third stage of anæsthesia
50 per cent	50 per cent	2 minutes
33⅓ per cent	66⅔ per cent	3 minutes
25 per cent	75 per cent	4 minutes
20 per cent	80 per cent	5 minutes
10 per cent	90 per cent	10 minutes
5 per cent	95 per cent	20 minutes

Mixtures of narcotic vapours and air can be made which are incapable of causing unconsciousness. Some mixtures will only slightly intoxicate; others will cause analgesia (insensibility to pain without loss of consciousness). Accurately formulated mixtures for causing analgesia open up possibilities which hitherto have not been available to practitioners of the art of healing.

CASUAL COMMENTS.

Ether-Convulsions.

It is apparent from a communication which reaches us from Australia that the problem of ether convulsions is now interesting anæsthetists on that side of the world.

It is greatly to be hoped that we shall get a first-hand account of their experiences to put beside our own. Dr Hornabrook, in the communication to which we refer, sums up his opinion in the statement that ether convulsions are "damn bad work." This is forcible but not illuminating, nor is it in accordance with the facts. For one of the remarkable features of this phenomenon is that for many years, during which there was an enormous use of ether, and certainly a huge amount of "damn bad work," since by that is meant overdosing with the drug, there was no appearance of ether convulsions. During those many years when the routine methods of anæsthesia in this country were almost universally either "gas and ether," continuing with ether from a Clover's inhaler, or else open ether throughout, there must have been many thousands of persons thoroughly overdosed with ether. Certainly the present writer has seen hundreds with large pupils, sweating foreheads, shallow breathing and utter relaxation. Nevertheless, neither he nor anyone else saw "ether convulsions." Moreover, some of these cases have been in the hands of men who are incapable of "damn bad work." What is the reason? Why did this phenomenon apparently never crop up untill about 1913? Why has it been so comparatively frequent since the war? It is unmentioned by so careful an observer as the late Sir Frederick Hewitt who evidently never saw these convulsions in the course of his vast experience with ether. Neither, apparently, did the late Dr. Dudley Buxton.

What is the new factor which has led to the occurrence of convulsions fairly frequently during the last few years? Many factors were suggested and ruled out by the facts in the paper which Dr. Charles Hadfield read a few years ago, before the Anæsthetic Section of the Royal Society of Medicine. Giving ether with the passage through it of a stream of oxygen, impurities in the ether, large doses of atropine beforehand, all have been put forward as causative agents. Yet the evidence does not allow us to attribute the convulsions to any one of these things. Dr. Hadfield's collected evidence seemed to show that extra warmth was the one factor common to most of the cases. This may not be incompatible with the idea put forward by Mr. Ashley Daly in our last issue, viz., that cerebral congestion is perhaps the immediate precursor of the convulsive attack. Yet

if this were so it is odd that the innumerable patients given full doses of ether for long periods in the Trendelenburg position never went into convulsions. These women were, in many instances, kept in a highly congested state so far as their heads were concerned, even, sometimes, to the degree of œdema of the eyelids, yet no instance of convulsions was reported.

We are interested to know that the Anæsthetic Committee (Medical Research Council and Royal Society of Medicine) is making an effort to collect evidence with regard to ether convulsions. It will be especially valuable if they succeed in getting useful information from other countries, for hitherto the phenomenon does not appear to have been noted in any medical journals except those of Great Britain. At any rate we have found no mention of the symptom in Continental journals, nor, what is more surprising, any that we can remember in the voluminous anæsthetic periodic literature of the United States and Canada.

Dr. Hornabrook has also some strong words to say on the subject of premedication. His view is that the use of drugs before anæsthesia to the degree in which they are commonly employed nowadays is a fruitful source of post-operative lung complications. He takes up an extreme attitude: "I will not bring a patient on to the operating table in a stage of full unconsciousness, nor will I permit one of my students to do so; and I am even more strongly opposed to permitting a patient being removed from the operating table until he is in a condition of being roused." It appears that the operating surgeons with whom our correspondent works are a great deal more amenable and insensible to inconvenience than their fellows in Great Britain; for action along the lines laid down by Dr. Hornabrook must involve a good deal of waiting on the part of the surgeon. Moreover, from the patient's point of view we are not prepared to concede the great psychical gain of going to sleep quietly in bed and waking up there again afterwards. There are many persons for whom the entire absence of fear, discomfort and surprise, constitutes an important element in the successful conduct of their operation experience. This is obtainable without adding to the risk of post-operative lung complications if the premedication and anæsthetic are correctly managed. We do not question the essential safety of Dr. Hornabrook's method, which relies on the use of, at most, not more than four ounces of ether per hour, but when we read his description it is hard to believe that he maintains, for upper abdominal work, a degree of relaxation which would satisfy most operating surgeons. Modern complicated measures involving elaborate premedication, and often the cutting out of the larynx by endotracheal tubes or by cocainisation, have come into vogue in abdominal work, chiefly to get rid of the saturation with ether, which alone was found enough to produce the required relaxation.

The main object, we take it, of the modern anæsthetist is to get the best results with the least employment of either chloroform or ether. He has largely abolished the former, and is striving hard to abolish the latter. It may be that, improperly used, his methods are, as Hornabrook maintains, more dangerous than the dangers which they are designed to remove. They must not be judged, though, by their results when improperly employed. When used with the same care and skill that Dr. Hornabrook gives to his more simple procedures the modern methods are able to give a degree of safety and comfort that we do not think can be otherwise achieved even by Dr. Hornabrook.

With regard to the incidence of lung complications Dr. Hornabrook states that he "has not seen a trace of post-operative pneumonia for years" and he attributes this partly to the following routine practice which he follows. Before the patient leaves the table "his nostrils are held closed for a second or two, then released and then held again. This not only helps to rouse the patient, but makes him take two or three deep breaths which fully expand the lung alveoli." The sister in charge is told to close one of the patient's nostrils by pressure of her finger every two or three hours after he is back in bed. It is interesting to note that the first two minutes of induction of anæsthesia by Hornabrook's method are occupied by the administration of chloroform. However well the drug is diluted, and however carefully it is given, this appears to be flying in the fact of all that experience has taught with regard to absolute safety in inducing anæsthesia.

ANÆSTHETIC SECTION.

(The Royal Society of Medicine).

At a Meeting on February 5th, Dr. Bernard Hollander read a paper on "Hypnosis and Anæsthesia," which we publish at page 99.

At the meeting on December 4th, the President, Mr. Ramsay G. Phillips in the Chair, Dr. C. W. Morris opened a discussion on "Anæsthesia for Major Throat Operations." He began by describing the methods adopted for ensuring anæsthesia during Mr. Trotter's operation for dealing with malignant growths in the hypopharynx.

The especial difficulties presented by the patients are :—

(1) Obstruction to respiration due to restriction of the air passage by the growth.

(2) Lung complications following operations.

(3) The difficult of allowing the surgeon the maximum degree of freedom for his field of operation, without hampering him with anæsthetic apparatus.

The degree of obstruction varies. When severe it is dealt with by tracheotomy under novocain before the main operation is undertaken. It is important to recognise slight degrees of obstruction as these may become severe during early stages of induction. When they are present gr. $\frac{1}{100}$ atropine is given beforehand and anæsthesia induced with chloroform on an open mask under which a small stream of oxygen is admitted throughout.

Chloroform is chosen as the agent least likely to increase respiratory embarrassment. When the third stage of anæsthesia is reached a low tracheotomy is performed and a wide bore tube inserted. If there is difficulty during the tracheotomy, and this takes an unusually long time, or the patient becomes cyanosed, then the patient is sent back to bed after the tracheotomy and the major operation postponed to a later date. Lung complications are most to be feared, and every means possible is employed to lessen the likelihood of them arising. First and foremost is the question of sepsis, and any steps taken to lessen this will help to ward off the onset of pneumonia. The state of the patient's mouth and nose is here of great importance. Seeing that any lung complications following operation are considered by some surgeons to connote an error on the part of the anæsthetist, it behoves us to take all possible steps to have dental sepsis removed beforehand. Mr. Trotter is satisfied with nothing less than the removal of every tooth. Exception to this is allowed only if the patient is young and the teeth sound, which is unusual in connexion with these major throat operations. The gums must

be given time to heal before the radical operation can be attempted with a reasonable chance of safety. A second point in guarding against post-operative pneumonia is the prevention of blood being sucked or running down the trachia during operation. For this reason the tracheotomy is done deliberately, all bleeding points being secured before the trachia is opened.

With a wide bore tracheotomy tube safely in position it is possible to pack off completely the entrance to the larynx from above during the operation, the packing being changed as often as is necessary when it is soaked. Packs soaked in cocaine or adrenalin are also employed to render the mucous membrane analgesic, and they lessen the amount of general anæsthesia required. A tracheotomy is preferable to the use of an endotracheal tube because it affords a safer method for completely packing off the larynx and no risk of carrying down infection or a particle of growth. Also it gives the surgeon greater freedom. Moreover in most of these cases it is necessary to retain a tracheotomy tube for some weeks to maintain an unobstructed airway and allow the wound to heal without mucus from the lungs passing over the raw surfaces. Chloroform is well suited to these patients, who are rarely sick afterwards. It enables them to be kept free from congestion and so lightly under that they usually leave the table with cough reflex present. The method consists in bubbling oxygen through chloroform in an ordinary Junker's bottle and leading the vapour mixture to the patient through a short rubber tube with a malleable endpiece hooked into the mouth of the tracheotomy tube. A Mennell's turning cock fitted to the Junker allows one to deflect the oxygen straight to the patient without passing it through chloroform when one wishes to do away with the latter but not the former. Often the amount of chloroform consumed is not more than three or four drams per hour. The change in the behavious of the patient's respiration after tracheotomy is worthy of note. The regular to-and-fro breathing is replaced by long periods of apnœa, followed by periods of dyspnoea, and this may continue throughout the operation. Usually these variations give place to a more profound type of breathing. Unless the anæsthetist is familiar with the phenomenon he may be tempted to start artificial respiration during the periods of apnœa.

For growths occurring higher up in the air passages a different course is adopted; either a preliminary laryngotomy is performed and the pharynx packed off from the larynx, or else resort is made to endotracheal anæsthesia. The nearer the operative measures approach the upper opening of the larynx the more danger there is of laryngeal obstruction developing afterwards, and the more necessary is a laryngotomy in preference to an endotracheal tube. The laryngotomy tube is left in position for the first 12 to 24 hours after operation. Where the operation is well away from the opening

of the larynx and there can be no danger of obstruction afterwards an endotracheal method is most satisfactory. Dr. Morris prefers a wide bore soft rubber tube providing for a return airway, and supplies the vapour under low pressure. The nasal route for the passage of the tube presents many advantages. To the free upper end of the tube a Rowbotham metal angle piece is fastened and to this a delivery tube from the anæsthetic apparatus can be connected, allowing either gas and oxygen or chloroform to be given at will. Dr. Morris suggested that, referring back to those cases where the disease is in the hypopharynx or on the cords and a tracheotomy is a necessary part of the operation, the preliminary tracheotomy would be better performed in all cases under local anæsthesia. This should be done on a previous day and the patient allowed to accustom himself to the new type of breathing. He submitted that this step, in conjunction with more rigid attention to oral sepsis, might give an improved immediate prognosis.

Mr. Lionel Colledge said that the main principle was that there should be no respiratory obstruction. If this was allowed to occur it was usually too late to do tracheotomy, for th edamage had already been done; the tracheotomy might restore the breathing but the anæsthesia would not proceed quietly again, and if there was a pulmonary complication in this type of case it was not due to the anæsthetic but to the respiratory obstruction. When the entire larynx had to be removed, if there was no obstruction it was useful at an early stage of the operation to open the cricothyroid membrane, put in a laryngotomy tube, pass the anæsthetic through that, and remove the tube with the larynx. This obviates the necessity of doing a preliminary tracheotomy and one had a clean wound.

Dr. I. W. Magill recommended connecting up the tracheotomy tube to a closed system and using nitrous oxide and oxygen with free medication beforehand. For this he employs morphine and scopolamine and small doses of nembutal.

ABSTRACTS.

Clinical significance of the dorsal roots in spinal anæsthesia. A. L. WILLINSKY. *Canadian Medical Association Journal* December, 1931.

The author correlates known facts of anatomy and physiology to form a working hypothesis in explanation of disturbances produced by spinal anæsthesia. Among other things he remarks that "this important general principle, that the essential basis of all purposeful and effective motor activity is to be found in accurate sensory information, seems to have been overlooked by many authors in spinal anæsthesia." The Corollary to this dependence of motor on sensory activity is, of course, that there is no need to claim any effect of spinal analgesics on anterior roots in order to explain the paralysis that follows endothecal injection. Starling, many years ago, pointed out that experimental section proximal to the ganglia of all the posterior nerve roots supplying a limb produces a functional, though not an actual, paralysis of the muscles of that limb. This is the kind of paralysis that accompanies spinal analgesia. The author proceeds to show that a careful scrutiny of the histology of the nerve roots elucidates the selectivity of novocain when introduced within the theca. This is associated with the presence of a large number of non-myelinated fibres in the dorsal roots of spinal nerves. The author describes the various interoceptive, exteroceptive and propreoceptive groups of the filaments of the dorsal roots, and correlates the physiological and clinical phenomena concerned with intrathecal injection. His conclusions are :—

(1) That all the disturbances produced in this form of anæsthesia can be explained by the effect of the drug on the afferent side of the nervous system.

(2) There is anatomical, physiological, pharmacological and clinical evidence in support of this view.

(3) Spinal anæsthesia is a pure, posterior radicular block of variable intensity.

High and low spinal anæsthesia. H. GOLDBERG-WHYTE and AUBREY RADFORD. *Journal of Medical Association of South Africa,* December, 1931.

The authors have used Pitkin's solution as routine and are thorough in their preliminary medication. This is effected by 22½ grains of medinal in 2 ounces of water per rectum two hours before operation, followed by hyoscin gr. $\frac{1}{100}$, atropin gr. $\frac{1}{100}$, morphin

gr. $\frac{1}{8}$, given hypodermically, three-quarters of an hour before operation. In emergency cases they give the hyoscin mixture intravenously, with the patient on the table, when he usually drops off to sleep in 10 minutes, or less. They attach importance to anæsthetizing the skin before puncture, and use a very fine needle with short blade. For high anæsthesia they place the patient on his face, with head and shoulders bent downwards, causing the spine to take an angle with its apex at about 4 or 5 degrees. The patient is left in this position for 10 minutes and the table tilted to five degrees Trendelenburg and the patient gently turned on to his back, taking care not to lift the head. A stream of oxygen is allowed to play on the face during operation. The anæsthesia has lasted about one and three-quarter hours with three cubic centimetres of the solution. The oldest patient was 73, and the youngest was three years old, in a series of 300 cases.

Recent advances in spinal anæsthesia. E. G. VAN HOOGSTRATEN. *South African Medical Journal*, January 23, 1931.

The author puts forward one or two somewhat unusual views. He classifies patients, from the point of view of spinal work, into (1) those who react normally, (2) those who are hypersensitive, and (3) those who are hyperresistant, and he puts in the hypersensitive class "heavy, cadaverous, alcoholic, hard-living people" in addition to those more expected people suffering from prostatic complaints, septicæmia, old age, general peritonitis and others. The hyperresistant group includes most tuberculous cases, people with red hair, brain workers and children. Race seems to have an influence and, as a rule, larger doses are needed for the English and South Africans than for the Dutch, German or Belgian people. Novocain is the drug used, the dose varying according to the height and duration of anæsthesia required—three cubic centimetres of a five per cent solution being regarded as the average dose. The author uses intravenous saline with adrenalin (one cubic centimetre to the pint) for combating low blood-pressure, as well as ephedrine to prevent the fall. He states that the "great indication for intravenous adrenalin is loss of cerebration or consciousness. So long as the patient's cerebration is good, i.e. he is able to understand and answer questions, the blood supply to the brain and medulla is sufficient and there is no need to worry. Should, however, the patient become dull and unable to speak or understand when spoken to, instantaneous action is called for." It may be remarked here that many patients go to sleep and lose consciousness during spinal analgesia without their being in a dangerous state at all.

In the same journal H. Garin draws attention to secondary bleeding after the use of percaine as a local anæsthetic. He narrates three cases to show that persaine used locally "does certainly cause serious late bleeding and that no patient operated on in these conditions

ought to be allowed to go home," but must be kept under observation and drastic measures must be taken at once if bleeding starts a few hours after operation.

Contribution to the technique of spinal anæsthesia. CARL SEURT. *Acta Chirurg. Scandinav.*, Vol. lxix, Fasc. 11-111.

THIS is one of the best articles on the subject that has appeared recently, for the author sets forth to answer simple important questions in a simple straightforward manner, and his conclusions appear to be irrefutable. The chief doctrine which he proves is that diffusion of the injected anæsthetic fluid can be prevented entirely, and that accurate results can be obtained by using the effect of gravity with a simple novocain solution. His method is to use small amounts of five per cent novocain in spinal fluid, to lose no fluid, to inject slowly and steadily, taking 20 seconds per cubic centimetre, and to make all movements of the patient slowly. In a series of 223 cases his results were constant to such a degree that he feels justified in drawing the conclusions which he states. Making the injection with the patient on his side and keeping him there the analgesia was strictly limited to the dependent side, showing that no diffusion of anæsthetic took place. After about 15 to 20 minutes novocain is fixed to the nerve roots, and no change in anæsthesia occurs with movement. Before this period, by altering the patient's position, you can alter the level and the site of the anæsthesia by the influence of gravity on the injected novocain. Individual variations in results Seurt attributes to varying quantities of nerve tissue in different individuals. Big muscular subjects have, he maintains, larger nerve roots and therefore there is more nerve tissue to be affected and a larger dose is needed than with a slight, less muscular individual. The amount of novocain, the rate at which it is injected, and the position of the patient are the factors by which Seurt regulates height and duration of analgesia. His method appears admirably simple and the logic of its theory is unassailable.

Treatment of barbital poisoning with glucose. Anæsthesia and Analgesia, Jan.-Feb., p. 22.

THE popularity of barbiturates in anæsthetic practice at the present time renders important the knowledge of effective antidotes should the use of one become necessary. The case is related of a man who took 13 grams of barbital, with suicidal intention, on September 1 at 3 p.m. At 8 p.m. on September 2 he was cyanotic, unconscious, with dilated pupils, temperature 102.6, pulse 150 and resirations 64 per minute. His stomach had been washed out and strong coffee and other stimulants administered. He appeared about to die. Then 800 cubic centimetres of 20 per cent dextrose were given intravenously. An hour later the patient became restless, moving for

the first time. At 6 a.m. next morning he talked and could swallow. The following day he was composed and semiconscious, and two days later he was rational.

Pharmacology of avertin. Anæsthesia and Analgesia, Jan.-Feb., 1932, p. 83.

RAGINSKY and Wesley Bourne sum up the results of their investigations. The chief conclusions are :—

1. Avertin fluid in higher concentrations than those found in normal avertin anæsthesia produces no deleterious effects on the heart.

2. Adrenalin in avertin anæsthesia frequently produces cardiac irregularity.

3. Avertin has by no means the same damaging effect on the liver as chloroform, and can probably be used safely in individuals with moderate liver damage.

4. Avertin anæsthesia may be interrupted or considerably shortened by the administration of ephedrine. This property of ephedrine is clinically valuable in overcoming too profound avertin anæsthesia.

Pernocton anæsthesia. RICHARD PFEILER. *Schmerz Narkose-Anæsthesia, Dec.-Jan.,* p. 273.

THE article is based on 135 administrations for various major operations in persons from 20 to over 80 years of age. In about 52 per cent no additional anæsthetic was used; in the remainder ether was given in small quantities. Pfeiler injects three to four cubic centimetres of pernocton intravenously, taking one minute for every cubic centimetre, and does not give any preliminary drug. He never met excitement during induction. There was one instance of restlessness afterwards; usually, the patient came round so slowly that most of the night after the operation passed before awakening. Three patients died in coma and complete anuria. They were subjects of advanced kidney disease, and this is now regarded as an absolute contra-indication to the use of pernocton.

Pantocain. By HELMUT SCHMIDT. *Schmerz Narkose-Anæsthesia,* Dec.-Jan., p. 277.

THIS novocain derivative is described as being pharmacologically ten times as powerful as its mother substance, and having an anæsthesic duration two to three times as long. Its superficial action is said to be ten times that of cocaine. Chemically, pantocain differs from novocain in that the di-ethyl group is replaced by a di-methyl group and a n-butylradical is introduced which is contained also in percaine. Solutions stand boiling without change, and alkali glass does not interfere with them. Its duration of action, though greater than that of novocain, is less than that of percaine. It has

been used in 230 cases of spinal anæsthesia. The dose employed was three cubic centimetres of one per cent solution in three cubic centimetres of cerebro-spinal fluid for the lower abdomen. The injections are not to be made in the sitting position, only in the lying position. Ampoules are prepared with gliadin, and this viscous form of the injection is preferred to the watery solution. The content of each ampoule is equal to three cubic centimetres of the watery solution. The ampoules are sterilized for ten minutes at 108°C.

SECTION OF ANÆSTHETICS.

BRITISH MEDICAL ASSOCIATION.

We have received the following notice from the secretaries of the Section, with the proviso that the exact titles of the papers are not yet fixed and those given must be regarded as provisional and not necessarily exact.

CENTENARY MEETING, LONDON, 1932.
July 26th, 27th, 28th and 29th.

President-Elect:

The Rt. Hon. LORD DAWSON OF PENN,
P.C., G.C.V.O., K.C.B., K.C.M.G., P.R.C.P. (Lond.).

SECTION OF ANÆSTHETICS.
(Including Psycho-Anæsthesia).
(Two Day Section).

President:

Sir Francis E. Shipway, K.C.V.O., M.D., 55 York Terrace, Regent's Park, N.W. 1.

Vice-Presidents:

R. E. Apperly, M.R.C.S., L.R.C.P., 102a High Street, St. John's Wood, N.W. 8.
Wesley Bourne, M.D., C.M., F.R.C.P.(C), Department of Pharmacology, Biological Building, McGill, University, Montreal.
Gilbert Brown, M.B., Ch.B., 46 Walkerville Terrace, Gilberton, Adelaide, Australia.
Ashley S. Daly, M.R.C.S., L.R.C.P., 60a, Portland Place, W.1.
G. W. B. Daniell, M.R.C.S., L.R.C.P., Marine Hotel, Hermanus, C.P., S. Africa.
Henry W. Featherstone, M.D., 45 Newhall Street, Birmingham.
A. L. Flemming, M.B., Ch.B., 48, Pembroke Road, Clifton, Bristol.
C. Langton Hewer, M.B., B.S., 30 Queen's Road, St. John's Wood, N.W. 8.
E. Falkner Hill, M.B., Ch.B., 11 Anson Road, Victoria Park, Manchester.

Hon. Secretaries:

W. Howard Jones, M.B., B.S., 43 Cambridge Street, Hyde Park W.2.
F. B. Parsons, M.D., M.R.C.P., 56, Trumpington Street, Cambridge.

At the Physical and Chemistry Theatre, Royal College of Science.
Wednesday, July 27th, 10 a.m.

Professor Finsterer of Vienna: "Anæsthesia for Abdominal Surgery."

Dr. E. Falkner Hill, Manchester: "Spinal Analgesia."

Thursday, July 28th, 10 a.m.

Dr. Wesley Bourne, Montreal: "The Effects of Anæsthetics on the Liver."

Dr. Featherstone, Birmingham: "Post-operative Complications."

CORRESPONDENCE

65 St. George's Terrace,
Perth, W.A.
November 20th, 1931.

The Editor, *British Journal of Anæsthesia,*

Dear Sir,

The Australian Medical Congress is being held at Perth, Western Australia, in October 1932. An Anæsthetic Section will be included. Following on the successful inauguration of an Anæsthetic Section at the last Congress in 1929, it is hoped that we may be able to attract some overseas anæsthetists to visit us next year when our Congress is in progress.

Any visiting anæsthetist can be assured of a hearty welcome, and it is needless to say how much his presence will be appreciated by anæsthetists in Western Australia and other parts of Australia. Any anæsthetist who contemplates making the trip is asked to get into touch with any of the undersigned.

We would be obliged if you will give this publicity in your journal.

Yours truly,

D. D. Paton
(*President of Congress*)

M. Kasner Moss
(*Western Australian Vice-President of Anæsthetic Section*)

G. Troup
(*Secretary of Anæsthetic Section*)

London,
March 24th, 1932.

To the Editor, *British Journal of Anæsthesia.*

Sir—You will be doing me a kindness, and I think you will also benefit many of your readers, if you will favour me with your advice on the topic I wish to raise. I am recently qualified and I want to become specially skilled in anæsthetics. What course exactly do you recommend me to follow? For obvious reasons I do not wish to make public the name of the hospital where I have been trained, though, of course, you will be able to discover it, if you wish, through my giving you my name, which I put at the close of this letter but do not wish it to be published, please. The point of my inquiry is this: Although I am qualified and, therefore, legally supposed to be perfectly competent in anæsthetics, as in any other branch of medicine, I have actually not given a single anæsthetic. I have been properly "signed up" for anæsthetics. In order to achieve this I did my turn at anæsthetic clerking and, of course, I saw anæsthetics given. It so happened that the anæsthetist I was under used almost entirely endotracheal methods. The inductions had to be carried out quickly, so he did them himself, and then, of course, he passed the tube himself, too. I learned all about the particular machine that he used, and certainly got to know well the conditions of patients in this particular kind of anæsthesia. But how am I to learn simpler methods and how to meet the difficulties which often arise when there is no tube through the larynx? It seems to me that if I get a resident post involving the giving of many anæsthetics it will be hard luck on my patients through whom I shall have to get my experience. What I want is to try a number of methods under the eye of someone skilled in them. Where am I likely to be able to do this?

Yours etc.,
"Inquirer."

We sympathize with our correspondent's difficulty and hope some of our readers can give him a helpful reply. [Ed.]